

## CLAIMS

What is claimed is:

1. A method for recovering peptides/amino acids and oil/fat from one or more protein-containing raw materials wherein the method comprises the following steps:

- a. grinding the raw materials;
- b. heating the ground raw materials to a temperature in the range of 40-62°C, preferably 45-58°C;
- c. optionally before and/or after the heating step, separating oil/fat from the raw materials in order to obtain a first oil product;
- d. adding water, the water having approximately the same or the same temperature as the raw materials, and wherein the pH of the water is adjusted by adding calcium;
- e. hydrolysing the raw materials with endogenous enzymes in order to prepare a hydrolysate:
- f. optionally during the hydrolysis step, adding a pH adjuster in order to maintain the desired pH value of the hydrolysate;
- g. heating the hydrolysate to 75-100°C, preferably 85-95°C;
- h. removing large particles from the hydrolysate, including non-hydrolysed proteins, which can be returned to the hydrolysis;
- i. optionally separating off fat/oil in order to obtain a second oil product;
- j. coagulating the proteins;
- k. removing the coagulated proteins;
- l. optionally separating off fat/oil in order to obtain a third oil product;
- m. optionally concentrating the remaining amino acids and short peptides; and
- n. optionally drying the concentrate in order to obtain dry short peptides and amino acids.

2. The method according to claim 1, wherein the water added in step d comprises 10-40%, preferably 20-30% water of a total reaction mixture.

3. The method according to claim 1, wherein the method takes place as a closed process.

4. The method according to claim 1, wherein the pH adjuster in step f is nitrogen gas, calcium or bone meal.

5. The method according to claim 1, wherein the method further comprises dividing the large particles from step h into bone portions for producing hydroxy apatite, protein residues that can be returned to the hydrolysis, and other solid particles.

6. The method according to claim 1, wherein the peptide and amino acid product has a fat content of < 0.1% and a salt content of < 1%.

7. The use the method according to claim 1 for producing a pharmaceutical product.

8. The use the method according to claim 1 for producing a food product.

9. The use the method according to claim 1 for producing a feed product.

10. The use the method according to claim 1 for producing a biotechnological product.

11. The use the method according to claim 1 for producing hydroxy apatite.

12. Amino acids/peptides prepared by the method of claim 1, wherein the amino acids/peptides do not contain allergens and DNA traces, and that the fat content is < 0.1% and the amino acids/peptides have a salt content of < 0.5% by weight.

13. Hydroxy apatite produced by the method of claim 5, wherein the hydroxy apatite does not contain allergens and DNA traces.

14. The first oil product produced by the method of claim 1, is cold-pressed and is of foodstuff quality.

15. A method for recovering peptides/amino acids from one or more protein-containing raw products, wherein the method comprises the following steps:

- a. grinding the raw materials;
- b. heating the ground raw materials to temperatures in the range of 40 to 62°C, preferably 45 to 58°C;
- c. optionally before and/or after the heating step, separating oil/fat from the raw materials in order to obtain a first oil product;
- d. adding water, the water having approximately the same or the same temperature as the raw materials, and wherein the pH of the water is adjusted by adding calcium;
- e. hydrolysing the raw materials with endogenous enzymes in order to prepare a hydrolysate;
- f. optionally during the hydrolysis step, adding a pH adjuster in order to maintain the desired pH value of the hydrolysate;
- g. heating the hydrolysate to 75-100°C, preferably 85-95°C;
- h. removing large particles from the hydrolysate including non-hydrolysed proteins;
- i. optionally separating off fat/oil in order to obtain a second oil product;
- j. removing the proteins and long peptides;

- k. concentrating the remaining amino acids and peptides;
- l. returning proteins and long peptides to the concentrate in order to obtain a protein product; and
- m. optionally drying the protein product in order to obtain a dried product containing proteins, free amino acids and short and long peptides.

16. The method according to claim 15, wherein the water added in step d comprises 10-40%, preferably 20-30% water of a total reaction mixture.

17. The method according to claim 15, wherein the method takes place as a closed process.

18. The method according to claim 15, wherein the pH adjuster in step f is nitrogen gas, calcium or bone meal.

19. The method according to claim 15, further comprises dividing the large particles from step h into bone portions for producing hydroxy apatite, protein residues and other solid particles.

20. The method according to claim 15, wherein the protein product comprises 5-95% by weight of free amino acids, preferably 30-60% by weight.

21. The method according to claim 15, wherein the protein product contains less than 0.5% by weight of fat.

22. The method according to claim 15, wherein the protein product contains less than 1% by weight of salt.

23. The use of the method according to claim 15 for producing a veterinary medical product.

24. The use of the method according to claim 15 for producing a food product.

25. The use of the method according to claim 15 for producing a feed product.

26. The first oil product produced by the method of claim 15, wherein the oil is cold-pressed and is of foodstuff quality.

27. A method for recovering peptides/amino acids and oil/fat from a protein-containing raw material, wherein the method comprises the following steps:

- a. grinding the raw materials;
- b. heating the ground raw materials to temperatures in the range of 40-62°C, preferably 45-58°C;
- c. optionally before and/or after the heating step, separating oil/fat from the raw materials in order to obtain a first oil product;
- d. adding water which has approximately the same or the same temperature as the raw materials, and wherein the pH of the water is adjusted by adding calcium;
- e. hydrolysing the raw materials with endogenous enzymes in order to prepare a hydrolysate;
- f. optionally during the hydrolysis step, adding a pH adjuster in order to maintain the desired pH value of the hydrolysate;
- g. removing solid particles and non-hydrolysed proteins which can be returned to the hydrolysis from the hydrolysate;
- h. periodically or continually separating off fat/oil in order to obtain a second oil product;
- i. optionally treating the hydrolysate against microorganism growth, preferably with UV treatment;

- j. separating off the molecular weight fraction of peptides/amino acids desired by membrane filtration, preferably of crossflow type;
- k. routing the portions of the hydrolysate that do not penetrate the membrane filter in point j back to the hydrolysis in step e;
- l. concentrating and optionally drying the permeate in order to obtain peptides/amino acids; and
- m. wholly or partly returning the distillate from the concentration to the permeate side of the membrane filter.

28. The method according to claim 27, wherein the method takes place as a closed process.

29. The method according to claim 27, wherein the pH adjuster in step f is nitrogen gas or bone meal.

30. The method according to claim 27, wherein the method further comprises dividing the solid particles from step g into hydroxy apatite, protein residues and other solid particles.

31. The method according to claim 27, wherein the second oil product recovered in step h is passed through a filter, and any heavy portions (e.g., stearic acid) are removed in order to obtain a cold-pressed, protein-free sterile oil.

32. A method for the hydrolysis of one or more protein-containing raw materials and the separation of amino acids/peptide, characterised in that the hydrolysis is carried out using the endogenous enzymes of the protein-containing material or materials; and

that the hydrolysate is passed through a membrane-like filter, wherein peptides/amino acids follow a permeate stream, whilst the active enzymes continuously break down any protein residues that are deposited on the membrane

surface and the enzymes are passed together with the retentate back to the hydrolysis.

33. A method for removing peptides and amino acids from a hydrolysis mixture, characterised in that the hydrolysis mixture comprising active enzymes, amino acids, peptides and non-converted proteins is passed through a membrane filter, wherein amino acids and any peptides are filtered off and the active enzymes present act to break down proteins that are deposited on the membrane filter.

34. The use of the method according to claim 27 for producing a pharmaceutical product.

35. The use of the method according to claim 27 for producing a biotechnological product.

36. The use of the method according to claim 27 for producing a food product.

37. The use of the method according to claim 27 for producing a feed product.

38. The use of the method according to claim 30 for producing hydroxy apatite.

39. Amino acids/peptides produced by the method according to claim 27, wherein the amino acids/peptides do not contain allergens and DNA traces, are virtually fat-free and have a salt content of  $< 0.5\%$  by weight.

40. The oil produced by the method according to claim 31, wherein the oil does not contain allergens or DNA traces.